



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/550,457

07/19/2006

Yumi Muroi

125404

4636

25944 7590 06/09/2008

OLIFF & BERRIDGE, PLC
P.O. BOX 320850
ALEXANDRIA, VA 22320-4850

EXAMINER

KEMMERLE III, RUSSELL J

ART UNIT

PAPER NUMBER

1791

MAIL DATE

DELIVERY MODE

06/09/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/550,457	Applicant(s) MUROI ET AL.	
	Examiner RUSSELL J. KEMMERLE III	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichikawa (JP Patent Publication 2002-201082, as discussed in applicant's current specification, identified in the previous Office Action as "Shuichi") in view of Suzuki (US Patent 4,354,991) and Kani (JP Patent Publication 61-026565). Citations to Kani refer to where that information can be found in the translation accompanying the previous Office Action.

Ichikawa discloses a method of making a silicon carbide (SiC) honeycomb structure by mixing and kneading a combination of SiC, metal Si, an organic binder and an alkaline earth metal to form a clay. This clay is then shaped into a honeycomb structure, heated to remove the binder, then fired at 1400-1800°C to form the finished body (see applicant's current specification, page 1).

Ichikawa as discussed by the applicant does not disclose that the firing be performed in a protective container made of SiC, or that an aluminum containing solid also be placed in the container during firing.

Suzuki discloses a method of making a SiC body where the shaped SiC body is fired in a container made of SiC, in order to control the atmosphere during firing and create a finished product having a superior surface (Col 6 lines 20-33).

Kani discloses a method of making a SiC body that involves molding and sintering a shaped SiC body, where the sintering occurs with an aluminum (Al)-containing substance present with the body (page 2, claim 1). Kani further discloses that this can be achieved by placing a lump (i.e., a block body) or powder (i.e., a particulate body) of Al metal with the green SiC body in a crucible with a lid during sintering, and the quantity of Al should be from 0.01-5% by weight based on the weight of the SiC body (paragraph spanning pages 6-7).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to have modified the method taught by Ichikawa, by firing the ceramic in a SiC crucible having an Al-containing material present in the crucible during firing. This would have been obvious because Suzuki discloses that placing the body in a SiC crucible during firing creates a desirable product without the need for hot pressing, and Kani discloses that placing an Al-containing material in the crucible during firing produces the desired result of Al as a sintering aid without having the Al as an impurity in the final piece.

While Kani discloses the use of a particulate body, it does not disclose the grain size of that particulate body. However, particulate bodies having a grain size from 0.01-1 mm are well known to those skilled in the art, and would have been obvious absent a showing of unexpected results.

Since the block body using the materials of the present invention is found to be obvious, as discussed above, a block body having the specific properties recited (which would be dependant mostly on the material) is also found to be obvious.

It is further noted that as long as one of the above is true (either the grain size of the particulate body or water absorption of the block body) that would be enough to render obvious claim 1, since it is written in the alternative as having one or the other, and need not have both.

The references as discussed above do not discuss a specific separation distance between the Al-containing body and the SiC body. However, one of ordinary skill in the art would know that the Al-containing body should be close to the SiC body in order for the Al vapor to easily reach the body, but not in contact with the SiC body as that would cause them to sinter together. Therefore optimizing the placement of the articles to within 50 cm of each other would be within the ability of one skilled in the art to create a situation where the Al vapors act on the SiC body during sintering, but they two materials do not sinter to each other.

Referring to claim 3, while Kani discloses specific examples using Al metal, Kani also says that any Al-containing material which will produce Al vapor during sintering would work, of which aluminum oxide is one (see, Arakawa, JP Patent Publication 61-291461, translation enclosed).

Response to Arguments

Applicant's arguments filed 14 February 2008 have been fully considered but they are not persuasive.

Applicant first argues that Tables 1-5 of the current specification (found on pages 16-22) show unexpected results due to the claimed features in the form of low failure rates and reduced pressure loss.

Referring to the alleged unexpected results with respect to the particulate body, these results are not found to overcome the *prima facie* obviousness of this limitation as discussed above. It is not clear that the results shown in Table 4 are commensurate in scope with the current claims. This is because the powder is placed in contact with the body to be fired (separation distance of 0 cm), and the failure appears to be attributed to the powder sintering to the body, which must then be removed. Therefore, it has not been shown that the allegedly unexpected results would be observed over the entire scope of the claim. Put another way, it has not been shown what results would be achieved by different particle sizes (both inside and outside the claimed range) over the entire scope of the claim (a separation distance up to 50 cm).

Referring to the alleged unexpected results regarding the water absorption rate (Table 5), these results are again not commensurate in scope with the claims. The claim recites a “water absorption equal to or above 0.05% by weight” with no upper limit. The results recite only reference examples with water absorption of 0-0.03% and inventive examples of 0.05% and 0.1%. However, the scope of the claim covers a material having a water absorption above 0.05%, and no results have been provided for water absorptions above 0.1%, unexpected or otherwise. Further, the examples given are only at a separation distance of 30 cm, it has therefore not been shown that these allegedly unexpected results would be present over the entire scope of the claim (separation distances of 0-50 cm other than 30 cm).

Referring to the allegedly unexpected results regarding the separation distance (Table 3), these results are again not commensurate in scope with the claims. First,

Art Unit: 1791

data is not provided over the entire claimed range, specifically the only data of inventive examples is at 30 and 50 cm, while the scope of the claim covers and separation distance below 50 cm. Second, the data is only provided for examples using a particulate body, and thus no results have been provided attributable to the separation distance when a block body is used.

Applicant next argues that one would not combine the teachings of Suzuki (creating a dense ceramic by sintering above 1900°C in a SiC container) with that of Ichikawa (creating a porous ceramic body by sintering at temperatures below 1800°C). Applicant similarly argues that one would not have been motivated combine the teachings of Kani (creating a dense ceramic by sintering at 1900-2300°C in the presence of an aluminum containing body) with that of Ichikawa. This is not found persuasive because it is not necessary that every aspect of one reference be combined with the other when one of ordinary skill in the art could recognize that certain aspects of the disclosure would provide an advantage in situations other than the exact ones where they are disclosed. Presently, one of ordinary skill in the art would recognize the advantages of Shuichi of firing a SiC body in a SiC container to better control the firing atmosphere, and of Kani that firing in the presence of an aluminum containing body which may act as a sintering aid while firing a SiC body. One of ordinary skill in the art would have further found it obvious that these ideas could be applied to other processes where a SiC body was being formed, and would have found it obvious to try them in the SiC body forming process of Ichikawa.

Applicant argues that since the products of Suzuki and Kani are not the desired product of Ichikawa one of ordinary skill in the art would not look to those disclosures for teachings of how the product or process of Ichikawa may be improved. This is not found persuasive because even though the products being produced may be different, the teachings of advantages of how different ceramic articles may reasonably be looked to in order to learn of possible improvements to other ceramic processes.

Applicant finally argues that the newly added limitation that the firing is carried out at 1400-1800°C further defines over any combination of the prior art. This is not found to be persuasive because Ichikawa discloses exactly that firing range. One of ordinary skill in the art would recognize that depending on many conditions and desired properties the firing temperature may need to be adjusted, and would recognize that when creating a porous article such as in Ichikawa a high temperature would not be desired as that would cause too much densification. Therefore, while one of ordinary skill in the art may bring in teachings from other disclosures, they would not be motivated to drastically change the firing temperature of Ichikawa in order to maintain a porous body.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RUSSELL J. KEMMERLE III whose telephone number is (571)272-6509. The examiner can normally be reached on Monday through Thursday, 7:00-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1791

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven P. Griffin/
Supervisory Patent Examiner, Art
Unit 1791

/R. J. K./
Examiner, Art Unit 1791